CLAIMS

1. Interferometry apparatus comprising:

a measurement light beam and a reference light beam which interact with each other to cause a spatial fringe pattern;

an optical device which interacts with the spatial fringe pattern, such that light is spatially separated into different directions;

and wherein the intensity modulation in two or more directions of the spatially separated light is phase shifted.

2. Interferometry apparatus according to claim 1 wherein the optical device interacts with the spatial fringe pattern such that within a fringe of the spatial fringe pattern, light is spatially separated into different directions.

3. Interferometry apparatus according to claim 1 wherein the light is spatially separated over at least a portion of one or more fringes of the spatial fringe pattern.

4. Interferometry apparatus according to any of claims 1 to 3, wherein the light is spatially separated into two or more sub-beams.

5. Interferometry apparatus according to any preceding claim wherein the spatially separated light in different directions is detected by optical detectors.

6. Interferometry apparatus according to claim 5

wherein the spatially separated light reaches the detectors via optical fibres.

7. Interferometry apparatus according to any of claims 5 or 6 wherein at least one focussing means is provided to focus the spatially separated light in the different directions into the optical fibres or onto the optical detectors.

8. Interferometry apparatus according any preceding claim wherein the optical device comprises at least one fresnel lens.

9. Interferometry apparatus according to any preceding claim wherein the optical device is a diffractive device.

10. Interferometry apparatus according to claim 9 wherein the optical device comprises a plurality of segments, wherein light from the spatial fringe field incident on each segment is diffracted into a different diffraction direction, thereby spatially separating the spatial fringe field.

11. Interferometry apparatus according to any of claims 9 or 10 wherein the optical device has a plurality of segments having different structures, the different segments being arranged in a repeating pattern.

12. Interferometry apparatus according to any of claims 10 or 11 wherein two or more segments of the plurality of the segments comprise blaze gratings, wherein the blaze gratings extend in different

directions.

13. Interferometry apparatus according to any of claims 10-12 wherein one of the plurality of segments has no structure.

14. Interferometry apparatus according to any of claims 1-7 wherein the optical device is a diffractive optical element.

15. Interferometry apparatus according to any of claims 1-8 wherein the optical device is a refractive device.

16. Interferometry apparatus according to claim 15 wherein the optical device comprises a plurality of segments, wherein light from the spatial fringe field incident on each segment is refracted into a different direction, thereby spatially separating the spatial fringe field.

17. Interferometry apparatus according to any of claims 15 or 16 wherein the optical device has a profiled surface, such that refraction at the profiled surface causes spatial separation of the spatial fringe field.

18. Interferometry apparatus according to any of claims 1-8, wherein the optical device comprises a coherent optical fibre bundle.

19. Interferometry apparatus according to any preceding claim wherein the optical device is configured such that the phase difference of the

spatially separated light beam enables outputs of the detectors to be combined to generate two signals with a known phase difference.

20. Interferometry apparatus according to claim 19 wherein the optical device is configured such that the phase difference of the spatially separated light beam enables outputs of the detectors to be combined to generate quadrature signals.